IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent No.	: 7,569,690	**Customer No.: 035811**
Issued	: August 4, 2009	
Serial No.	: 10/524,517	
Filed	: February 11, 2005	
Inventors	: Masao Morimoto	Docket No.: TIP-05-1008
	: Haruyo Sato	
Title	: PROCESS FOR PRODUCING	Confirmation No.: 1151
	: OXYCARBONYL-SUBSTITUTED	
	: PIPERAZINE DERIVATIVE	Dated: December 30, 2009

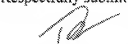
PETITION FOR A CERTIFICATE OF CORRECTION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The Patentees request that a Certificate of Correction be issued in the captioned case according to the enclosed document. The changes are to correct errors made during the printing of the patent. Therefore, no fee is required. Enclosed herewith are copies of pages 5 and 8 of the Preliminary Amendment filed on February 11, 2005, and a copy of page 2 of the Response filed February 4, 2008. Patentees do not authorize charging the Deposit Account of Patentees' Attorney with respect to this Petition, irrespective of any prior blanket authorizations regarding pending applications.

Respectfully submitted,



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CERTIFICATE OF CORRECTION

PATENT NO.: 7,569,690
DATED: August 4, 2009
INVENTOR(S): Morimoto, et al

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In Column 2

. At line 45, after "Summary", please insert:

-- We provide a process for producing an oxycarbonyl-substituted piperazine derivative, in which a piperazine derivative represented by general formula (1) is oxycarbonylated to produce an oxycarbonyl-substituted piperazine derivative represented by general formula (2)--;

and after the formula 2, please insert:

-- (where R^1, R^2, R^3 and R^4 denote, respectively independently, i) a hydrogen atom, ii) an alkyl group with 1 to 4 carbon atoms, iii) an alkoxy group with 1 to 4 carbon atoms, iv) a halogen group, v) a carboxyl group, vi) a carbamoyl group, or vii) an N-alkylcarbamoyl group with 1 to 4 carbon atoms in its alkyl group; X denotes i) an alkyl group with 1 to 4 carbon atoms, ii) an alkenyl group with 2 to 4 carbon atoms, iii) an alkynyl group with 2 to 4 carbon atoms, iv) an aralkyl group not substituted in the aromatic ring, or substituted by an alkyl group with 1 to 4 carbon atoms or by an alkyoxy group with 1 to 4 carbon atoms or by a halogen group, or v) an aryl group not substituted in the aromatic ring, or substituted by an alkyl group with 1 to 4 carbon atoms or by an alkoxy group with 1 to 4 carbon atoms or by a halogen group; excluding the case where all of R^1, R^2, R^3 and R^4 denote a hydrogen atom respectively), characterized in that an organic solvent with a water content of 15 wt% or less is used. The oxycarbonyl-substituted piperazine derivative can also be a racemic modification or optically active substance.--

In Column18

At line 61, please change "{A1/(A1+A2+A3+A4+A5)x100(%)" to {(A2+A3+A4+A5)/(A1+A2+A3+A4+A5)x100(%) --.

In Column 24

At line 41, please change "26" to -- 26° C --.

In Column 26

At line 45, please change "26" to -- 26° C --.

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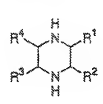
FORM PTO 1050 (Rev. 3-93)

PATENT NO. 7,569,690
No. of addl copies
@ 50¢ per page

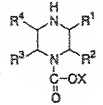
In the Specification

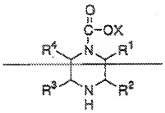
Please replace paragraph [0007] with the following:

[0007] We provide a process for producing an oxycarbonyl-substituted piperazine derivative, in which a piperazine derivative represented by general formula (1) is oxycarbonylated to produce an oxycarbonyl-substituted piperazine derivative represented by general formula (2)



(1)





(2)

(where R^1, R^2, R^3 and R^4 denote, respectively independently, i) a hydrogen atom, ii) an alkyl group with 1 to 4 carbon atoms, iii) an alkoxy group with 1 to 4 carbon atoms, iv) a halogen group, v) a carboxyl group, vi) a carbamoyl group, or vii) an N-alkylcarbamoyl group with 1 to 4 carbon atoms in its alkyl group; X denotes i) an alkyl group with 1 to 4 carbon atoms, ii) an alkenyl group with 2 to 4 carbon atoms, iii) an alkynyl group with 2 to 4 carbon atoms, iv) an aralkyl group not substituted in the aromatic ring, or substituted by an alkyl group with 1 to 4 carbon atoms or by an alkoxy group with 1 to 4 carbon atoms or by a halogen group, or v) an aryl group not substituted in the aromatic ring, or substituted by an alkyl group with 1 to 4 carbon atoms or by an alkoxy group with 1 to 4 carbon atoms or by a halogen group; excluding the case where all of R^1, R^2, R^3 and R^4 denote a hydrogen atom respectively), characterized in that an organic solvent with a water content of 15 wt% or less is used. The oxycarbonyl-substituted piperazine derivative can also be a racemic modification or optically active substance.

tetrahydrofuran, ketones such as 3-pentanone, tert-butyl methyl ketone, 2-hexanone, 3-hexanone and 2-heptanone. Preferred are aromatic hydrocarbons and alcohols, and more preferred are aromatic hydrocarbons. Especially preferred is toluene.

Please replace paragraph [0109] with the following:

In this invention, the contents of the impurities represented by the general formulae (5) to (8) contained in the reaction solution containing the oxycarbonyl-substituted piperazine derivative can be obtained in reference to the total amount of the impurities represented by the general formula (5) to (8) and the oxycarbonyl-substituted piperazine derivative represented by the general formula (2), i.e., from the following calculation formula ~~{A1/(A2 + A3 + A4 + A5)/(A1 + A2 + A3 + A4 + A5) × 100(%)~~, wherein A1, A2, A3, A4 and A5 respectively denote the area percentage of the oxycarbonyl-substituted piperazine derivative represented by the general formula (2), the area percentage of the impurity represented by the general formula (5), the area percentage of the impurity represented by the general formula (6), the area percentage of the impurity represented by the general formula (7) and the area percentage of the impurity represented by the general formula (8). Similarly the contents of the respective impurities can be obtained. ~~For example, the total of the impurities contained in the reaction solution containing the oxycarbonyl-substituted piperazine derivative represented by the general formula (2) can be obtained from {A2/(A1 + A2 + A3 + A4 + A5)} × 100(%).~~

Please replace paragraph [0113] with the following:

The analytical conditions for the Z-protection reaction and Boc-protection reaction of 2-methylpiperazine are shown below.

1) Analysis of Z-protection reaction composition

Model: Shimadzu LC-10Vp

Please replace paragraph [0139] with the following:

Comparative Example 5

A 200 ml four-neck flask with a pH meter and dropping funnel was charged with 10.02 g (= 0.100 mole) of racemic 2-methylpiperazine, and 80.2 g of 1-butanol was added for dissolution, being followed by addition of 20.1 g of water (water content 20.0 wt%). With vigorous stirring, benzyl chlorocarbonate was added dropwise. In this case, 48 wt% sodium hydroxide aqueous solution was added dropwise to keep the pH value of the system at 7.5 to 8.5, and as required, the system was cooled with ice to keep the internal temperature at 23 to 26°C (final water content 23.0 wt%). After completion of dropwise addition, with vigorous stirring, aging was carried out for 2 hours. The reaction solution was sampled and analyzed, and as a result, the reaction yield of 1-benzyloxycarbonyl-[[2]]3-methylpiperazine was 50.4%.

Please replace paragraph [0151] with the following:

Comparative Example 11

A 200 ml four-neck flask with a pH meter and dropping funnel was charged with 10.22 g (= 0.102 mole) of racemic 2-methylpiperazine, and 80.5 g of 1-butanol was added for dissolution, being followed by addition of 27.5 g of water (water content 25.4 wt%). With vigorous stirring, benzyl chlorocarbonate was added dropwise. In this case, 48 wt% sodium hydroxide aqueous solution was added dropwise to keep the pH value of the system at 8 to 9.5, and as required, the system was cooled with ice to keep the internal temperature at 23 to 26°C (final water content 26.9 wt%). After completion of dropwise addition, with vigorous stirring, aging was carried out for 2.5 hours. The reaction solution was sampled and analyzed, and as a result, the conversion of 2-methylpiperazine was 89.6%, and the selectivity of 1-tert-butoxycarbonyl-3-methylpiperazine was 73.5% (reaction yield 65.9%).